

MICROMECHANICAL LATCHING SWITCH

Abstract

A micro-electrical-mechanical-switch (MEMS) device comprises a semiconductor wafer, a first semiconductor layer formed on the semiconductor wafer, and a second semiconductor layer formed on the first layer. A first latching movable shuttle is formed in the second layer and has the first layer removed under the first movable shuttle, the first movable shuttle being moved in a first direction relative to the wafer in response to a predetermined acceleration of the MEMS device in a direction opposite to the first direction thereby changing an operating condition of the MEMS device from a first switch state to an intermediate switch state. A second latching moveable shuttle is formed within the first shuttle, the second shuttle being moved in a second direction relative to the first shuttle in response to a thermally activated force so as to change the operating state of the MEMS device from the intermediate switch state to a second switch state. In the second switch state an opening in the second latching moveable shuttle aligns with an opening in the wafer to enable an optical signal to pass through the aligned openings. In a second embodiment, a MEMS device comprises only one movable shuttle switch formed in the second layer, the shuttle switch being operated in response to a predetermined acceleration of the MEMS device.